DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claim 9 is rejected under 35 U.S.C. 101 because; the claimed invention is directed to non-statutory subject matter.

Regarding claim 9, it is noted that the computer program product is not clearly defined in the specification; therefore the reasonable interpretation is a computer program for performing the steps of video compression. Furthermore; the claimed invention, a computer program including instructions for performing the steps, as defined in the specification, page 3, paragraph 0036, encompasses both statutory and non-statutory embodiment and therefore consider non-statutory, thus fails to satisfy the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (Official Gazette Notice of 22 November 2005), MPEP 2106.1.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 4, 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 5,754,236) in view of Yamada et al. (US 6,801,572).

Regarding claim 1, Lee discloses, a method of generating a compressed video data stream (i.e., fig. 1), wherein the data stream is divided into blocks of image data (i.e., fig. 1, step 12), the method comprising the steps of determining first quantization scales Q for respective ones of the blocks (i.e., fig. 1, step 14, col. 2, lines 16-36), so that the quantization scales Q are sufficiently large to realize a predetermined compression rate (i.e., fig. 1, col. 2, lines 15-50), determining, for at least one of the blocks, determining a second quantization scale Q' results in a distortion of the at least one of the blocks that is less than or substantially equal to the distortion realized with the first quantization scale Q for the at least one of the blocks (i.e., fig. 1, steps 16-20, col. 2, lines 14-67 and col. 3, lines 40-45), encoding the digital data stream using the quantization scale for the at least one of the blocks (i.e., fig. 1, col. 2, lines 32-50).

Lee determines different quantization scale being used for different blocks, as discussed in the above.

Lee is silent in regards to explicit of second quantization scale being larger than the first quantization scale and encoding the block using second quantization scale.

Yamada (i.e., abstract, col. 4, lines 1 – 18 and 47-50) teaches comparing the quantization scale with the second quantization scale, and selecting the larger quantization scale to avoid picture quality deteriorated due to a high compression ratio.

In view of the above it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify the video encoding of Lee in accordance with the teaching of Yamada by comparing the quantization scale and selecting the larger quantization scale, in order to avoid picture quality deteriorated due to a high compression ratio, as suggested by Yamada (i.e., col. 3, lines 59-61).

Regarding claim 4, the limitations claimed have been analyzed and rejected with respect to claim 1 above.

Regarding claim 5, the limitations claimed are the apparatus of the method of claim 1, and the steps of generating a compressed video data stream have been addressed in claim 1 above.

Regarding claim 9, the limitations claimed are the computer implemented method of claim 1; since the disclosure of the combination teaching of Lee and Yamada is computer implemented; therefore the program/instruction to perform a method of encoding would have been necessitated.

5. Claims 2, 3 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 5,754,236) in view of Yamada et al. (US 6,801,572) further in view of Shih-Fu Chang (Error Accumulation of repetitive image coding).

Regarding claim 2, the combination of Lee and Yamada teaches computing quantization coefficients, the quantization unit 15 quantizes the DCT coefficients, e.g., compute quantization coefficients, based on the quantization scale for the block provided from the quantization control unit 10 (Yamada, fig. 14).

Yamada is silent in regards to explicit of, calculating a common divisor of at least a majority of the quantized coefficients, using a product of the greatest common divisor and the first quantization scale for the at least one of the blocks to determine the second quantization scale.

Shih (i.e., abstract, equation as shown in page 201, right column) teaches MPEG coding algorithms for computing quantized DCT coefficients having common divisor of at least a majority of the quantized coefficients.

In view of the above it would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the teaching of Yamada and Shih, as a whole, using the algorithm as shown in Shih for computing quantized DCT coefficients, in order to avoid error accumulation and maintain the image quality, as suggested by Shih (i.e., page 204, left column, third paragraph, lines 1-3).

Regarding claim 3, the limitations, the step of calculating a common divisor comprising, the greatest common divisor of the at least a majority of the quantized coefficients, is substantially similar to the limitation in claim 2 above, therefore the ground for rejecting claim 2 also applies here.

Regarding claim 6, the combination of Lee and Yamada teaches computing quantization coefficients, the quantization unit 15 quantizes the DCT coefficients, e.g., compute quantization coefficients, based on the quantization scale for the block provided from the quantization control unit 10 (Yamada, fig. 14).

Yamada is silent in regards to explicit of, calculating a common divisor of at least a majority of the quantized coefficients, using a product of the greatest common divisor and the first quantization scale for the at least one of the blocks to determine the second quantization scale.

Shih (i.e., abstract, equation as shown in page 201, right column) teaches MPEG coding algorithms for computing quantized DCT coefficients having common divisor of at least a majority of the quantized coefficients.

In view of the above it would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the teaching of Yamada and Shih, as a whole, using the algorithm as shown in Shih for computing quantized DCT coefficients, in order to avoid error accumulation and maintain the image quality, as suggested by Shih (i.e., page 204, left column, third paragraph, lines 1-3).

Regarding claim 7, the limitations, wherein the calculating of the common divisor comprises the greatest common divisor of the at least a majority of the quantized signal value, e.g., coefficients, is substantially similar to the limitations in claim 5 above, therefore the ground for rejecting claim 5 also applies here.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 5,754,236) in view of Yamada et al. (US 6,801,572) further in view of Shinya Kadono (Rationality of restricted re-quantization for efficient MPEG transcoding).

Regarding claim 8, the combination of Lee and Yamada, teaches extracting the first quantization scales from a compressed input video data stream (Yamada; fig. 14, steps 10-14).

Yamada is silent in regards to explicit of, an encoded video data stream being generated with requantized image.

Shinya Kadono (i.e., page 953, section 3 and page 954, section 4) teaches requantization image.

In view of the above it would have been obvious to one having ordinary skill in the art at the time of the invention was made to combine the teaching of Yamada and Shinya, as a whole, in order to remove mosquito noise and random noise, as suggested by Shinya (i.e., page 955, left column, lines 1-3).

Contact

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Behrooz Senfi whose telephone number is 571-272-7339. The examiner can normally be reached on M-F 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Behrooz Senfi/
Primary Examiner
Art Unit 2621